KOCH

KOCH NITROGEN COMPANY LLC

May 17, 2013

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Chief of the Hazardous Waste Permits Section
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RE Response to KDHE April 22, 2013 RCRA Post-Closure Permit Renewal Application – Determination of Completeness
Koch Nitrogen Company, LLC
Dodge City, Kansas
EPA RCRA ID No. KSD044625010

Ladies/Gentlemen:

This letter and associated attachments are provided to address completeness review comments provided by the Kansas Department of Health and Environment (KDHE) in a letter dated April 22, 2013 regarding Koch Nitrogen Company, LLC's (KNC's) RCRA Post-Closure Permit Application submitted on October 22, 2012. The purpose of this letter is to transmit the information requested by the KDHE and address, as applicable, agency comments.

KDHE's comments and KNC's responses are provided in Attachment A. Requested text edits are provided in Attachment B. Attachment C provides revised figures. We appreciate your time in this matter. Please call Elise Stucky-Gregg at (620) 371-7910 if you have any questions or would like to discuss.

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In accordance with Section I.F of Part I of the permit and Section B.22 of Part II of the permit, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or other persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Very Truly Yours,

Michael Sherbak
Plant Manager
Koch Nitrogen Company, LLC

Cc w/Attachments:

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Andrea R. Stone (electronic copy on CD)
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Tom Siegrist, KF, Wichita, Kansas (electronic)

ATTACHMENT A

KDHE 22 APRIL 2013
COMMENTS AND KNC RESPONSES

KDHE Comment #1: The text in Volume I of the permit application includes the checklist used to review the document. This checklist is not intended to be part of the application. Please remove the checklist and renumber the remaining pages of text. If KNC desires, the checklist can be included as an appendix to the application.

KNC Response: Comment noted. Attachment B provides the revised text of Volume I with the checklists removed and pages renumbered. KNC does not propose to provide the checklist as an appendix.

KDHE Comment #2: In Section I of the permit application, the text makes several references to Part II of the existing permit. KDHE anticipates receiving authorization from EPA to administer the Corrective Action Program prior to the completion of the renewal permit. As a result, most of the conditions specified in Part II of the existing permit will be moved to Part I of the renewal permit. Therefore, to facilitate the preparation of permit conditions for the renewal permit, please remove the references to Part II in the text of the permit application.

KNC Response: Comment noted. Attachment B provides the revised text of Section I with references to Part II of the permit removed. Section G was also revised to remove a reference to Part II of the permit.

KDHE Comment #3: The map features specified in 40 CFR 270(b)(19) are included in the figures provided in the permit renewal document, but not at a scale to reveal site details. Therefore, please submit a topographic map that is at a scale of 1 inch equals not more than 200 feet.

KNC Response: As discussed during our 29 April 2013 phone call, producing a 1 inch equals 200 feet scaled map is complicated by the large size of the KNC property and associated buffer. The site is approximately 3,930 feet wide (east/west) by 5,400 feet long (north/south) - including the portion that lies north of Highway 50. When the 1 mile buffer is included, the map size requirement would be 72 x 80 inches. Attachment C provides an "E-Size drawing", the largest standard engineering sheet size, drawing that depicts the Facility and adjacent properties.

KDHE Comment #4: Information that describes the nature and extent of any contaminants present in the groundwater is provided in the text but not presented graphically. Please submit maps that depict the constituents on these groundwater plumes.

KNC Response: Appendix E-5 of the Permit Renewal Application provides isoconcentration maps for site constituents in groundwater.

KDHE Comment #5: Figure B-7 shows the location of the monitoring wells, but does not identify them. Please revise this figure to show the label of each well.
KNC Response: Comment noted. Attachment C provides a revised Figure B-7 that includes the labels for monitoring and recovery wells at the KNC Facility.

KDHE Comment #6: Please revise Figure J-1 to show the boundaries of each solid waste management unit and area of concern at a scale of 1 inch equals not more than 200 feet.
KNC Response: As noted previously, utilizing a 1 inch equals not more than 200 feet scale is problematic. The E-size drawing included in Attachment C identifies the SWMUs and AOCs associated with the KNC Facility. The boundaries of these units are under investigation as part of on-going RCRA Facility Investigation (RFI) activities.

KDHE Comment #7: According to 40 CFR 270.14(c)(3), KNC is required to identify the point of compliance on a topographic map. None of the maps submitted by KNC meet this standard. Therefore please submit a figure that shows KNC's proposed point of compliance.
KNC Response: Comment noted. Section 4.3 of the Groundwater Sampling and Analysis Plan (GWSAP) identified monitoring wells B-1, A-3B, SIT-RG-08, TW-05, TW-79, and TW-80 as proposed point of compliance wells. The location of these wells is depicted in the revised Figure B-7 provided in Attachment C.

KDHE Comment #8: According to 40 CFR 270.14(c)(2), KNC is required to identify the direction of groundwater flow. To fulfill this requirement, please add arrows on Figure E-2 to indicate the direction of groundwater flow.
KNC Response: Comment Noted. Figure E-2, provided in Attachment C has been revised to indicate the direction of groundwater flow.

ATTACHMENT B

TEXT REVISION REPLACEMENT

SECTION A

PART A GENERAL INFORMATION REQUIREMENTS
40 CFR 270.13

A-1 Nature of Business - 40 CFR 270.14 (b)(1)

The Dodge City Nitrogen Facility is an existing facility that manufactures nitrogen fertilizers (SIC Code 2873), specifically anhydrous ammonia and urea ammonium nitrate (UAN). The ammonia unit is based on the steam-methane pressure reforming process for production of synthesis gas. The primary feedstock is natural gas.

The Dodge City Nitrogen Facility is a small quantity generator of hazardous waste. The Facility does not treat, store, or dispose of hazardous waste onsite.

From 1968 to 1983 the cooling tower was treated with hexavalent chromium as a corrosion inhibitor. Prior to disposal, the cooling tower blowdown was treated in the Chromium Destruct Unit (CDU). This regulated unit was certified closed as a hazardous waste treatment facility in February 1986. Additional information on the closure history is provided in Section I.

Based on the results of a 1992 soil survey, the facility's previous owner (Farmland Industries, Inc.) contended that the source of detected chromium in the groundwater was documented spills of chromate solution from the chromate storage tank that occurred in the early 1970s. Records indicate that the use of chromium as a corrosion inhibitor was discontinued in 1984.

A topographic map of the facility is included as Figure A-1. Figure A-2 indicates that the facility is not located on Federal lands or Indian reservations.

A-2 Hazardous Waste TSD Information - 40 CFR 270.13 (i), (j)

The Dodge City Nitrogen Facility is a small quantity generator of hazardous waste. The Facility does not treat, store, or dispose of hazardous waste onsite. The hazardous wastes handled at the facility have the following hazardous waste codes: D001, D002, D003, D005, D006, D007, D009, D011, D035, F003, F005, U134, and U161.

A-3 Above Ground Storage Tank Permits (Not RCRA-regulated tanks)

Tank #	**Capacity (gallons)**	**Material**
001	12,000	Nalco
004	61,000	Methyldiethanolamine
005	5,100	Sulfuric Acid
006	5,100	Sodium Hydroxide
007	4,900	Compressor Oil
008	2,000	Compressor Oil

Tank #	Capacity (gallons)	Material
009	1,100	Used Oil
013	3,800	GenGard GN8005
014	5,500	Empty/Clean
015	1,550	Sulfuric Acid
016	1,550	Sulfuric Acid
017	6,500	Sulfuric Acid
018	850	Biomate MBC781
019	5,300	NITROsolve 220

A-4 Photographs of the Former Chromium Destruct Unit

CDU Facing North

CDU Facing South

CDU Facing East

CDU Facing North

SECTION B

FACILITY DESCRIPTION
40 CFR 270.14 (b)(1)

B-1 General Description - 40 CFR 270.14 (b)(1)

The Facility is located 3 miles east of the City of Dodge City, in Ford County, Kansas (Figure B-1). The Koch Nitrogen Company, LLC (KNC) property (Property) is situated in Sections 22 and 15, Township 26 S, and Range 24 W. The southern portion of the Property on which the production facilities (Plant) are located consists of over 300 acres, situated directly south of State Highway 50. The Plant production area consists of approximately 30 acres, located in the NE1/4 of Section 22. Former wastewater ponds are constructed on approximately 75 acres of the Property, east and west of the production facilities. Land use on the Property outside of the production area and former pond locations is largely agricultural. KNC also owns an approximately 65-acre parcel, which is located north of the Plant and Highway 50. The northern property is located in the SE1/4 of the SE1/4 of Section 15 and most of the S1/2 of the NE1/4 of the SE1/4 of Section 15. Underground Injection Control (UIC) Well No. 3 is located on the northern property. Use of the northern land parcel is also agricultural.

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The Property is used for manufacture of anhydrous ammonia (NH_3) and urea-ammonium nitrate (UAN) solution. The Plant has operated since its construction in 1968 by Farmland Industries, Inc. (Farmland). KNC purchased the Plant out of bankruptcy proceedings in May 2003. Since KNC purchased the Property in 2003, much of the historical information in this revised Part B application is derived from Farmland records. KNC has endeavored to gather facts from those historic records as necessary to complete this application but KNC cannot assure the accuracy of those historic records.

Records indicate that the Plant was originally designed and operated as a NH_3 production facility. UAN production equipment was added in approximately 1975. The ammonia unit is based on the steam-methane pressure reforming process for production of synthesis gas. The primary feed stock is natural gas. Manufacturing support tasks consist primarily of maintenance of equipment and machinery including metal welding and prefabrication, and instrument and electrical system maintenance. The process equipment consists of boilers, cooling towers, stripping towers, heat exchangers, storage tanks, and pumps and compressors.

Two deep (6,500 foot) injection wells are currently utilized at the Plant (Injection Wells 2 and 3) for disposing of wastewater into a deep bedrock saline aquifer (the Cambro-Ordivician Arbuckle Formation) under UIC permits issued by the State of Kansas. The original injection well at the Plant (Injection Well 1) was taken out of service in approximately 1976. Injection Wells 2 and 3 are currently used for the disposal of non-hazardous wastewater flow from the Plant and groundwater recovered from the groundwater collection system maintained in accordance with the RCRA post closure permit. The locations of the injection wells are presented on Figure B-7 and are summarized as follows:

- Injection Well No. 1 was constructed west of the product storage area in 1968, and the record reflects that this well was operated until 1976 as a permitted backup disposal system to the North and South Ponds. Injection Well No. 1 lost its injection capacity in 1976, and subsequently Farmland commissioned plugging of the well.

- Injection Well No. 2 was constructed in 1993 and is located on the southwest corner of the Property.

- Injection Well No. 3 was constructed in 1998 on property now owned by KNC north of Highway 50.

Three ponds, having a total surface area of over 75 acres (North, South, and East Ponds), were permitted for evaporation of stormwater and wastewater. The ponds have historically received process water, sanitary wastewater effluent, and stormwater runoff from the Property. The process stormwater from the Facility currently drains into either the wastewater drains located inside the process areas, where it is disposed of in one of the two underground injection wells, or the earthen ditches, where it flows to the north pond or towards the east field. Wastewater sources included the reverse osmosis (RO) treatment unit, ammonia unit condensate, regeneration fluids from the four-bed demineralizer and mixed bed polisher, cooling tower blowdown, and boiler blowdown. The combined wastewater stream historically potentially contained ammonia, chromium, neutralized sulfuric acid and sodium hydroxide, organic material, and small quantities of other process chemicals.

The North, South, and East Ponds were previously permitted for disposal of liquid non-hazardous wastes. Records reflect that the North and South Ponds operated from approximately 1968 to 1998 and the East Pond operated from approximately 1976 to 1984. These ponds are not currently used by KNC for wastewater disposal, but may still receive surface runoff from the Property. Since the ponds were taken out of service, the water levels have declined, and the pond bottoms are heavily vegetated. The ponds currently receive only stormwater runoff from upgradient areas. Process wastewater is disposed of through underground injection and is no longer discharged to the evaporation ponds.

The East Pond, constructed in approximately 1976, was a clay-lined evaporation pond intended to increase water storage capacity and evaporation potential of the Facility wastewater treatment system. The East Pond was constructed after Injection Well No. 1 was plugged and taken out of service. The East Pond had an approximate surface area of 40 acres. This pond was located east of the process area and south of the CDU. Process wastewater formerly discharged to the East Pond is believed to have been similar to the wastewater discharged to the South Pond. The East Pond was reportedly closed in 1984, and the area reverted to agricultural use. The record reflects that the East Pond was closed by Farmland as a wastewater lagoon; however, no records on the East Pond closure are available.

Until 1984, records reflect that Plant cooling water was treated with a corrosion inhibitor containing hexavalent chromium. Prior to disposal, the cooling tower blowdown was treated in the CDU, located adjacent to the ammonia unit cooling tower on the east side. The CDU consisted of concrete mixing basins and an asphalt-lined settling chamber. Use of the CDU ceased in 1991, when an electrochemical chromium treatment facility was installed. The electrochemical treatment was located in the Chromium Treatment Building. In 2006, a new RO treatment unit, the Osmo PRO 300 System, was installed. Records reflect that between 1968 and 1984, the CDU treated cooling tower blowdown water to reduce the hexavalent chromium to a trivalent chromium form. In 1984, the CDU was adapted to reduce chromium levels in groundwater collected from remedial wells located on the Property.

Farmland records indicate a release to groundwater occurred during the 1970s, caused primarily by a spill of approximately 1,200 gallons of cooling water corrosion inhibitor chemical and leaking underground piping. Chromium was discovered in groundwater at a private well east of the Plant in 1982. Since that date, numerous groundwater monitoring and recovery wells have been installed on the Property in an effort to contain and define the extent of the chromium contamination. Well locations are shown on the topographic map provided in Figure E-1 of Section E.

Operation of the recovery well system can be controlled manually or by radio telemetry using an industrial computer for operator interface. The current system allows the selection of individual banks of wells to be turned on or off with the telemetry equipment. The groundwater recovery and treatment system for the reduction of chromium contamination currently in use consists of recovery wells, an RO unit, a settling basin, a 2.8 million gallon equalization tank, a 300,000 gallon wastewater tank, a filtration facility, and two Class I nonhazardous injection wells.

A portion of the recovered groundwater is used, after treatment, in the industrial process. The remaining groundwater is pumped directly to the wastewater disposal system for disposal in the two existing Class I non-hazardous waste injection wells. Groundwater removed for disposal is pumped directly from recovery wells to the wastewater building pit and then to the 300,000 gallon wastewater tank. Prior to discharge to the injection wells the wastewater is filtered.

B-2 Topographic Map - 40 CFR 270.14 (b)(19)

A Topographic map of the Plant and required area outside the Plant has been prepared (Figure A-1). Information required by 40 CFR 270.14 (b)(19) is listed below with a reference to applicable the figure(s).

- All buildings are shown as well as the location of the former CDU and all the monitoring wells (Figures A-1 and B-6).
- The topographic map identifies land use outside the Property (Figure B-3).
- The topographic map identifies the portion of the Property within the 100-year flood area determined by the National Flood Insurance Program (Figure B-2).
- The wind rose shown is current for the Dodge City airport and is issued by the National Weather Service (Figure B-5). The airport is located about 1.5 miles to the southwest.
- The Solid Waste Management Units (SWMUs), which have been operated on the site, are identified on the topographic map (Figure J-1).

The Plant currently does not routinely generate hazardous waste. Hazardous waste is infrequently generated during disposal of expired chemicals and maintenance project waste. The Plant maintains a hazardous waste generator identification number (KSD 044625010).

Farmland Industries, Inc. certified closure of the CDU as a treatment facility with the KDHE Bureau of Waste Management. A closure certification was filed in accordance with 40 CFR 265.115 on 19 February 1986. The CDU has been replaced by a treatment system to treat non-hazardous levels of chromium in groundwater pumped from recovery wells. A Closure Plan was submitted on January 13, 2004, in accordance with Section III.B.1 of Part I of RCRA Permit. Section I-1 provides a closure history for the CDU.

B-3 Location Information - 40 CFR 270.14 (b)(11) and 264.18

Seismic Standard

This standard does not apply because this is an existing facility.

Floodplain Standard

Figure B-2 depicts surface waters in the vicinity of the Facility. According to data from the Federal Emergency Management Agency, the facility is not located within a 100-year floodplain.

B-4 Traffic Patterns - 40 CFR 270(b)(10)

The only traffic consists of trucks delivering materials and hauling away products. Traffic enters the one main gate, controlled by personnel in the plant control room, and staffed on a 24-hour basis. Load bearing capacity does not apply. Approximately 40 to 50 semi-trailer trucks enter the plant daily, with fluctuations based on plant activities.

SECTION E

GROUNDWATER MONITORING
40 CFR 270.14 (c)

E-1 General

Historic records indicate that the former CDU was in operation from 1968 to 1991. It was initially used to treat cooling tower blowdown when hexavalent chromium was used as a corrosion inhibitor in cooling water systems. The CDU was later used to treat groundwater recovered through operation of a groundwater recovery system.

Site records indicate that a spill of a liquid corrosion inhibitor containing chromic acid occurred sometime in the 1970s, west of the ammonia plant cooling tower releasing approximately 1,200 gallons from a broken pipe connected to the chemical storage tank. The release to groundwater was confirmed in 1982. Since that time, additional monitoring and recovery wells have been installed to monitor the extent of chromium and nitrate in groundwater.

The groundwater recovery system was designed and is currently used to remove and contain groundwater containing chromium, nitrate, nitrite, and select volatile organic compounds (VOCs). Recovered groundwater is transferred via under-ground piping to a reverse osmosis (RO) treatment unit. The RO system is capable of treating all of the recovered groundwater for reuse in the industrial processes in the Plant prior to its disposal in the two existing Class I non-hazardous waste injection wells.

E-2 Groundwater Monitoring

Groundwater monitoring activities will continue as specified in the Sampling and Analysis Plan ("SAP"), provided in Appendix E-1. Well inspections, groundwater level measurements and samples will be collected and analyzed at the frequencies specified in the SAP. This schedule will be followed until the concentration of constituents of concern at the compliance point wells have been reduced to levels at or below the groundwater protection standard for a period of 3 years. The groundwater protection standards for on-site constituents of concern are summarized in Table E-1. Since the timeframe for achieving this reduction at the compliance point cannot be predicted, the monitoring program will continue for such time as is necessary to achieve the groundwater protection standard at the compliance point for three years.

The locations of site monitoring and recovery wells are posted on the topographic map provided in Figure E-1. During the summer of 2012 monitoring and recovery well locations and elevations were resurveyed by a surveyor licensed by the State of Kansas. A summary of well construction details, recent survey data, boring logs and well construction logs for site wells are provided in Appendix E-2. A Kansas certified laboratory will perform all groundwater sample analyses. The groundwater analyses results are provided to the KDHE in Corrective Action Reports on an annual basis.

Table E-1: Protection Standards for Groundwater Constituents of Concern		
Parameter[1]	**Groundwater Protection Standard[2]**	**Units**
Nitrate (as Nitrogen)	10	mg/L
Nitrite (as Nitrogen)	1	mg/L
Chromium (Total)	0.1	mg/L
1,1,1-Trichloroethane	0.2	mg/L
1,1-Dichloroethene	0.007	mg/L
Tetrachloroethene	0.005	mg/L
Trichloroethene	0.005	mg/L
Vinyl Chloride	0.002	mg/L

Notes:

mg/L – milligrams per liter

[1]Only VOCs that have been previously detected in groundwater are listed. If other VOCs are detected they will be compared to the applicable KDHE or EPA groundwater protection standards

[2]Groundwater protection standards are from the EPA Regional Screening Level (RSL) Summary Table (April 2012)

E-3 Regional Geology and Hydrogeology

A detailed description of the regional geology and hydrogeology was provided in the Remedial Facility Investigation (RFI) Work Plan (KNC, 2005). A summary of the RFI Work Plan description is provided below. The facility is underlain by geologic layers that, from oldest to youngest, include Cretaceous Age-Dakota Sandstone and Graneros Shale; Tertiary Age-deposits commonly referred to as the Ogallala formation; and undifferentiated Pleistocene and Recent unconsolidated soils. These deposits have been grouped into major units, from youngest to oldest, as follows:

- Unconsolidated Deposits – Tertiary, Pleistocene, and recent deposits near surface;
- Graneros Shale – Cretaceous age deposits that separate unconsolidated deposits from the Dakota Formations; and
- Dakota Formation – Cretaceous age deposits underlying the Graneros Shale

Ford County-wide, groundwater flow within the unconsolidated deposits is influenced by surface water features, primarily the Arkansas River (south of the Plant). County-wide flow paths developed using potentiometric surface data downloaded from the Kansas Geological Survey-Data Access and Support Center (KGS-DASC) clearly indicate an east southeast flow path

(KNC, 2005). Generally, the county-wide flow path indicates discharge of groundwater toward the Arkansas River. These data support earlier observations reported by Waite (1942). Recharge to the unconsolidated deposits is derived mainly from precipitation. Because annual average precipitation in the Dodge City area is less than the evapotranspiration rate, significant recharge is not anticipated.

The unconsolidated deposits are underlain by the Graneros Shale at depths ranging from approximately 100 to 165 feet. The Graneros Shale consists of bluish to gray, noncalcareous claystone and shale. Waite (1942) estimated that Granerous Shale thickness ranges from 30 to 50 feet in Ford County.

The Dakota Formation underlies the Graneros Shale and is composed of white, gray, red, brown and tan claystone, siltstone, shale, and sandstone. The thickness of the Dakota Formation in Ford County is variable and appears to be 235 thick at a well in Spearville, approximately 12 miles to the northeast (Waite, 1942).

E-4 Site Geologic Setting

Woodward-Clyde Consultants performed a detailed evaluation of hydrogeological conditions at the Plant, as reported in a technical report dated May 10, 1988, which is included in Appendix E-3. Site geology is presented on pages 10-13 of this report. The Woodward-Clyde study was specifically undertaken to provide cross-sections, pumping tests, and slug tests to characterize groundwater flow characteristics at the Plant. Piezometer clusters were installed in three locations during the study.

Since the Woodward-Clyde Consultants study was completed, multiple soil and groundwater sampling programs have been performed to characterize the hydrogeologic conditions underlying the Plant and off-site areas. Revised cross-sections that depict the hydrogeology underlying and adjacent to the Plant from these borings are provided in Appendix E-4. Boring logs for the earliest monitoring wells frequently included highly generalized geologic material descriptions. More recent boring logs included geologic material descriptions that are much more detailed. To correlate geologic material layers in the cross sections, some interpretation was performed to aggregate geologic materials into five classes based primarily on their anticipated hydrogeologic (porosity and transmissivity) properties.

- Fine Grain - mostly clay, but may contain some silt and/or sand.
- Medium Grain - poorly sorted sediments consisting of grain sizes from clay to sand.
- Coarse Grain - mostly sand, but may contain some silt and/or clay.
- Caliche - mostly clay, but may contain a wide variety of grain sizes. The primary characteristic is significant caliche hardening.

- Graneros Formation - mostly shale, but may contain some sandstone and siltstone. The Graneros Formation is the uppermost bedrock unit underlying the site.

Once the geologic materials were aggregated, the classes form the basis for the updated cross-sections. For ease of comparison the vertical scale of all the cross sections was the same. Contacts between aggregated geologic layers were manually drawn using traditional cross-section techniques. The cross-sections also identify the total depth of boring and, where identified, the top of the Graneros at a particular location.

The site is underlain by Tertiary deposits commonly referred to as the Ogallala Formation. The deposits are primarily clay with lesser amounts of caliche, sand, silt and gravel. Generally, clay with some silt and sand are encountered in the top 50 feet of the unconsolidated deposits. At depths below approximately 50 feet, caliche layers are noted in many of the borings with thicknesses varying from a few feet to greater than 50 feet thick. The unconsolidated deposits generally coarsen below 50 feet below ground surface (bgs), if the caliche is absent, to more sandy or silty clay deposits that become predominantly sandy with depth. For many of the borings through the unconsolidated deposits, the sandy water-producing layer of the unconsolidated deposits (Ogallala) is underlain by a dry clay that rests on the contact with the underlying Graneros Shale (e.g., MW-26, SIT-RG-01, TW-26, and MW-26).

E-5 Site Hydrogeologic Setting

At the Facility and in the adjacent area, groundwater is present within the unconsolidated depths of the Ogallala Formation ranging from approximately 70 to 140 feet bgs. Figure E-2 provides the four quarterly potentiometric surface maps documented in the 2011 Annual Groundwater Corrective Action Report. On all dates, the predominant flow direction was to the southeast with groundwater extraction affecting flow and gradients in the area of recovery wells.

The saturated thickness of the Ogallala varies widely. Generally, the unconfined aquifer thickness is highest to the northeast, northwest and west of the Facility (Figure E-3). Note that the saturated thickness is partially affected by the pumping of groundwater. The thickness of the unconfined aquifer decreases substantially, over 30 feet, with many dry wells (e.g., MW-24, TW-81A, MW-25, and MW-26) to the southeast. The potentiometric surface maps generally mimic the unconfined aquifer thickness map with higher water table elevations to the northwest and northeast decreasing to the southeast along the predominant and regional groundwater flow vector. As noted in previous submittals, the historic water level data indicate that the water table elevation is declining approximately 2 feet per year. Slug testing completed by Woodward-Clyde (1998) and provided in Appendix E-3 yielded an average hydraulic conductivity estimate of approximately 14 feet per day (ft/day), which is noted in the RFI Work Plan (KNC, 2005) to compare favorably with the results of specific capacity testing results provided in the Kansas Geological Survey (KGS) database.

Additional hydraulic testing of the Ogallala was performed in 2012 through: i) single well permeability testing on 53 recovery and monitoring wells; and ii) single well aquifer performance tests on 5 recovery wells.

Single well permeability or slug tests were conducted on both recovery wells and monitoring wells to estimate the hydraulic conductivity of saturated aquifer materials adjacent to the screened section of the wells. Recovery wells were tested using a rising head method where a volume of water was instantaneously removed from the well and the recovery curve of the water level was measured until initial static conditions were reached. The submersible pump in each recovery well was initially shut down and the well was allowed to recover to static conditions prior to the initiation of the slug test. When the slug test was initiated, the well submersible pump was started and the water level within the well was recorded to determine the drawdown within the well. After 1 to 2 feet of drawdown occurred (usually 10 to 20 seconds of run time) the submersible pump was shut down and the well was allowed to return to 90% of initial static conditions. Each recovery well was tested two to three times using this methodology.

Monitoring wells were tested using pneumatic slug testing. Pneumatic slug testing was completed by: i) attaching an air tight testing head to the well; ii) pressurizing the airspace above the water column in the well with compressed nitrogen to depress the water table between 2 and 3 feet; and iii) instantaneously releasing pressure with the wellhead valve which resulted in the de-pressurization of the well and return of the water level to initial static conditions. The recovering water levels were then recorded by a pressure transducer. Each test was run until the water level recovered to at least 90% of the total static water level. On average, three tests were conducted on each well. The slug test data was analyzed using commercially available software designed to analyze slug and aquifer performance test data. The Hvorslev (1951) equation for unconfined aquifers was used to estimate hydraulic conductivity.

Constant rate aquifer performance tests (APTs) were conducted at 5 recovery wells to aid in determining the transmissivity of the saturated aquifer. Observation wells were not located close enough to the pumping wells to measure a hydraulic response, therefore, only the water levels in the pumping wells were monitored during each test. Each APT spanned approximately 2 hours including the background monitoring, pumping, and recovery phases. Initially, the submersible pump in each well was shut off and the water level in the well was allowed to return to initial static conditions. Once initial static conditions were reached, the submersible pump in the well was started and drawdown monitored. The constant flow rate was recorded with an in-line flow meter. Flow rates were recorded prior to the initial shutdown of the submersible pump, after the initial startup of the drawdown portion of the test, and after drawdown in the well stabilized. Water levels during all phases of the APT were monitored with a pressure transducer. Discharge rates varied by well and ranged from approximately 4 gallons per minute (gpm) to 9 gpm. The APT data were analyzed with commercially available software using methods appropriate for unconfined aquifers to estimate transmissivity. The analytical solutions utilized were Theis (1935), Cooper-Jacob (1946), and Neuman (1974) which each assume unconfined aquifer and fully penetrating well conditions.

The values of hydraulic conductivity calculated by the slug tests ranged from a minimum of 7.14 E^{-7} feet per day (ft/day) to 19.5 ft/day with a geometric mean of 0.958 ft/day. The geometric mean of the testing data was within the range of previously determined hydraulic conductivity. The transmissivities calculated by the single well APT's ranged from 11.61 feet squared per day (ft^2/day) to 37.31 ft^2/day with a geometric mean of 24.41 ft^2/day. The corresponding hydraulic conductivity ranges from 0.19 to 1.24 ft/day with a geometric mean of 0.67 ft/day. The results of this additional testing are summarized in Tables E-2 and E-3.

Table E-2: Slug Testing Summary

Parameter	**Hydraulic Conductivity (ft/day)**
Minimum	7.140E-07
Maximum	19.5
Geometric Mean	0.958

Table E-3: Single Well APT Summary

Parameter	**Transmissivity (ft^2/day)**	**Hydraulic Conductivity (ft/day)**
Minimum	11.614	0.194
Maximum	37.312	1.244
Geometric Mean	24.410	0.669

As documented in the RFI Work Plan (KNC, 2005), during a May 2005 pumping test at well cluster B-1 and B-2 (spaced approximately 10 ft apart) a head separation of approximately 60 feet was noted between the unconsolidated deposits and the Dakota formation. During the short term pumping test, the lower Dakota Formation monitoring well was stressed (i.e., pumped) and the position of the water-table was measured in both wells. Throughout the pumping and recovery phase, water level fluctuations were not noted within the unconsolidated deposits monitor well. These pumping test data as well as the period-of-record water level elevation indicated a separation between the over/underlying systems.

E-6 Constituents of Concern Groundwater Distribution

The distribution of chromium and nitrate in Ogallala groundwater monitoring wells over four quarters are documented in the 2011 Annual Groundwater Corrective Action Report (KNC, 2012). Appendix E-5 provides the Total Chromium, Hexavalent Chromium, and Nitrate plus Nitrite as N isoconcentration maps presented in the 2011 Annual Groundwater Corrective Action Report. Appendix E-6 provides a summary compilation of groundwater monitoring results from 2010 through 2011. The highest total chromium concentrations are generally present in the northeast corner of the plant (Appendix E-5 Figure 4-1) with a similar quarterly distribution and

concentration. The highest concentrations of nitrate plus nitrite (as N) were consistently located near the central and south portions of the plant (Appendix E-5 Figure 5-1). The concentrations of nitrate as N decrease in all directions toward the periphery of the monitoring network.

In August 2012, KNC contractors collected groundwater samples from select monitoring and recovery wells to aid in groundwater delineation of VOCs and support identifying the optimum locations for VOC sampling and analysis for the revised GWSAP (Appendix E-1). Figure E-4 provides a summary of groundwater VOC results, where available, for monitoring and recovery wells during 2011 and 2012 groundwater sampling activities. These data were provided to the EPA and KDHE in the 3rd Quarter 2012 RCRA Progress Report. The wells identified for routine semiannual groundwater sampling and VOC analysis are included in Table 1 of the SAP (Appendix E-1). These locations were identified to: i) confirm delineation; ii) track VOC changes over time where detected; and iii) confirm the lateral extent of VOCs.

KNC currently monitors two wells (referred to as Dodge City Services and Feedmill) screened in the Dakota Formation. As noted in multiple Quarterly RCRA Progress reports, KNC has been unable to sample the Dodge City Services well since the 4th Quarter of 2010 as the current owner has closed the facility and KNC has not been able to obtain access to sample this well. The analytical results for the past 2 years (Appendix E-6) indicate that neither hexavalent nor total chromium has been detected in these wells. The maximum reported nitrate plus nitrite as N concentration in these wells was 1.9 mg/L.

E-7 Corrective Action Program

The current Corrective Action Program consists of: i) pumping over 60 wells at various locations within and outside the Plant; ii) transferring recovered groundwater to the RO unit for treatment, and iii) groundwater monitoring.

Well construction records (Appendix E-2) indicate the previous Plant owner installed the groundwater recovery system in stages with the majority of wells installed between 1982 and September 1984. Major expansions of the groundwater recovery network by the former Plant owner were as follows:

- Recovery wells TW-71, TW-72, TW-73, TW-74, and TW-75 were installed to the northeast of major Plant operations in May and September of 1985;
- The network was expanded to the southeast (TW-76, TW-77, TW-78, and TW-79) and southwest (TW-80) from 1989 to 1991;
- Additional recovery wells were added directly east and southeast of the Plant (TW-82, TW-83, TW-84, TW-85, and TW-86), west (TW-87 and TW-88), and southwest (TW-89, TW-90, and TW-91) in January and April 1993;

- The last major expansion took place in 1995 when recovery wells (TW-92, TW-93, and TW-94) were added south and southwest of the Plant.

The recovery wells remove approximately 100 to 200 million gallons of groundwater per year (KNC, 2012). KNC has reviewed the previous owner's records and has not identified groundwater modeling reports and/or any other technical rationale for the location, anticipated capture, and/or anticipated recovery from the original groundwater recovery system and/or subsequent expansion of the network. Little is known about the operation and maintenance of the groundwater recovery system by the former owner over the almost 20 years of operation prior to KNC purchasing the Site. The pumps currently utilized in recovery wells are predominantly 0.5 horsepower with maximum flow of between 5 and 10 gallons per minute.

The remedial objective for the Corrective Action System, as outlined in Section VI.C.2.a of the Permit, is as follows,

"The Permittee shall implement a corrective action program that contains contaminated groundwater and prevents further migration of hazardous constituents above the GWPS included in Permit Attachment C [40 CFR 264.100]"

To achieve this objective the permit requires pumping from a specific set of wells to create an inward hydraulic gradient toward the facility (IV.C.1.a, IV.C.1.b, and IV.C.2.b), with groundwater monitoring (IV.C.2.c). Section IV.C.3a and b reinforce that the specific set of wells identified for pumping must be utilized. KNC is in the process of evaluating groundwater and system performance data, and groundwater modeling information, and anticipates submitting an addendum to this permit renewal application providing a proposed update to the design and operation of the Corrective Action System that better meets project objectives. By prior agreement with the Agencies, KNC is preparing a proposal to amend the current corrective action program to incorporate newly obtained groundwater information and improvements to the groundwater recovery and treatment system, and this proposal will be submitted by no later than 28 February 2013.

SECTION F

PROCEDURES TO PREVENT HAZARDS
40 CFR 270.14 (B)(4)

F-1 Security Procedures - 40 CFR 270.14 (B)(4)

The Plant is currently staffed 24-hours per day, consistent with continuous plant operations. Staffing and hours of operations may vary in accordance with business needs. The Plant is completely fenced with primary access through the main gate, which is monitored continuously by a contract guard service. Access through this gate is also monitored by closed-circuit television. The monitor is located in the main plant control room, which is also staffed continuously. The gate is equipped with an electrical operator and can be controlled by the guard or plant personnel in the control room.

Employee and visitor vehicles are parked in parking lots outside the fence. Only company vehicles, delivery trucks, and trucks picking up product are normally allowed within the plant confines.

Praxair, an independent company, leases land in the northwest portion of the KNC production area, outside of the KNC fenced area. Praxair maintains the fences, gates, and parking lot around its facility.

Many of the monitoring wells are located off-site. In order to protect the wells from vandalism, all wells without recovery pumps are equipped with locking caps.

In case of an emergency at the facility, plant personnel would notify one of the following responsible Plant personnel.

KNC, Dodge City Nitrogen Plant	**(620) 227-8631**
Plant Manager	(620) 371-7906
Environmental Leader	(620) 371-7910
Environmental Specialist	(620) 371-7914

In the event that main telephone number changes do occur, KDHE will be informed in writing so the telephone list will be kept current.

Warning signs are posted at each entrance to the active portion of the facility in accordance with 40 CFR 264.14 (c).

F-2 Preparedness and Prevention Requirements - 40 CFR 270.14(b)

The Plant is equipped with an on-site alarm system capable of alerting employees of an emergency. Additional internal communications are accomplished using the plant telephone system and two-way radio system. External communication can be accomplished via the plant telephone system by dialing 9 and then the number.

The plant is equipped with fire control equipment and portable fire extinguishers that are located throughout the plant. Spill control equipment is maintained at the plant site and is available for use during spill containment and cleanup.

Water for use in emergencies is contained in an on-site one-million gallon water tank. The water is supplied by two 300 gallon per minute (GPM) electric driven pumps and one 300 GPM steam driven pump for the primary supply. These pumps kick on automatically when the fire monitors are opened.

In order to operate more effectively, the Ford County Fire Department, West Plains Regional Hospital, Ford County Emergency Management, and The Ford County Sheriff's Department have been briefed on materials handled.

Inspections of the groundwater well network are performed during routine well sampling/gauging events (see Groundwater Sampling and Analysis Plan in Appendix E-1).

SECTION G

CONTINGENCY PLAN
270.14(b)(7)

G-1 Detection and Internal Reporting

Upon detection of an accidental release or spill from the groundwater recovery system, the spill will be immediately reported, by radio or telephone, to the KNC Environmental Department (the primary emergency coordinator). KNC Environmental Department personnel will mobilize to the location of the release for confirmation and to assess the extent of the spill.

G-2 Isolation and Containment

Once the release or spill has been confirmed by the KNC Environmental Department, the location will be isolated. If the release or spill is limited to the immediate area of a single well, the area may be isolated by turning off the power to the well pump and closing the header valve to the recovery system. If the release or spill is the result of a line break along the recovery system KNC Environmental Department or personnel working under the direction of KNC Environmental Department personnel may: i) close off isolation valves at appropriate locations within the piping system; ii) turn off individual banks of recovery wells; and/or iii) or turn off the entire recovery system, as appropriate.

Once the release or spill area has been isolated within the groundwater recovery network, KNC Environmental Department personnel will direct containment. Depending on the size of the release or spill shovels and/or earth moving equipment may be used to create berms to prevent further migration.

G-3 Removal and Disposal

Once contained, KNC Environmental Staff will direct the removal of free liquids using a hydrovac truck or portable pump depending on the size of the release or spill. Recovered groundwater will be directed to a containment vessel and subsequently transported to the groundwater treatment system. Saturated soil will be excavated using hand tools and/or earth moving equipment, depending on the magnitude of the release or spill, containerized, characterized, and properly disposed of in accordance with applicable regulations.

G-4 Post-Response Actions

After free liquids and saturated soil have been removed, KNC will perform necessary repairs to prevent future incident. Confirmation sampling may be performed by the KNC Environmental Department or under KNC Environmental Department personnel direction after removal activities are complete, or as part of on-going Resource Conservation and Recovery Act (RCRA) Facility Investigation activities.

Disposable equipment (e.g., gloves) will be containerized, characterized, and disposed of in accordance with applicable regulations. All non-disposable equipment (hand tools, hydrovac, backhoe) will be cleaned using a pressure washer on a concrete-lined decontamination pad that drains to a common sump.

G-5 Reporting Requirements

The KNC Environmental Department will generate a summary spill report that will contain, at a minimum, identification of: i) the release date; ii) the estimated release volume; and iii) KNC response actions. These spill records and a copy of the contingency plan procedures will be maintained on-site by KNC Environmental Department personnel. Spill reporting to applicable agencies will be performed in accordance with the SPCC.

SECTION H

PERSONNEL TRAINING
40 CFR 270.14 (b)(12)

H-1 Overview of Training Program - 40 CFR 270.14 (b)(12)

The RCRA related activities at the Plant include the sampling and analysis of groundwater, operation and maintenance of the treatment system for the recovered groundwater, and inspection of facilities. The Environmental Specialist(s) is designated as the person responsible for the supervision of sampling and analysis of groundwater, inspection of facilities, quality control of chromium treatment system operation, and supervision of maintenance activities related to the monitoring and disposal wells. Water recovery and treatment systems fall directly under the Operation and Maintenance Departments of the Plant.

The Environmental Leader is the immediate supervisor of the Environmental Specialist(s) and, as such, is responsible for the training required to carry out RCRA responsibilities. The training program consists of the program described below and additional on-the-job training, which will be completed by all Environmental Specialists within six months of their employment. All Environmental Specialists are required to participate in an annual refresher program, which is an abbreviated form of the complete training program. Particular emphasis in the annual refresher training will be given to the analytical procedures to insure maintenance of quality of laboratory results needed to recertify the laboratory.

All Operation and Maintenance personnel involved in operation and maintenance of the monitoring wells, water recovery and treatment systems, and disposal wells shall complete the training program prior to being assigned work related to these systems. In addition, all shall receive annual refresher training.

A written description of the type and amount of both introductory and continuing training that will be given to each person filling a position will be included with the training records. Records documenting the job title and description for each position, names of employees, and completed training programs will be kept onsite. These records will be kept until completion of the post-closure period for current employees. Former employees' records will be kept for three years after their termination.

The Environmental Leader and Specialists are the personnel directly responsible for managing and implementing the Post-Closure Plan.

All other in-plant personnel are either directly or indirectly responsible for managing and implementing the Post-Closure Plan.

All other in-plant personnel are involved either directly or indirectly with operation and maintenance of the systems. They receive training without the laboratory analysis topics. All trained personnel receive annual refresher training.

SECTION I

CLOSURE POST-CLOSURE PLANS AND FINANCIAL REQUIREMENTS

I-1 Closure History

According to facility records, the prior facility owner used chromium-based chemicals in the plant cooling system until 1984, when use of these chemicals was permanently ceased and replaced by an organo-phosphate corrosion inhibitor. On 21 September 1982 the KDHE determined that the inactive chromium destruct unit (CDU) met the RCRA definition of a tank and should be designated as such. The prior owner submitted a closure plan on 14 February 1985 to close the inactive CDU in accordance with the RCRA tank closure requirements. Closure activities consisted of the following:

- Draining and flushing the cooling system to remove soluble chromium until hexavalent chromium was no longer detected in the flush water.
- Removing the remaining cooling water chemical from chemical storage and having it shipped off-site. Following removal of the inhibitor the storage tanks were triple rinsed to remove residual chromium.
- Treating flush and rinse water to eliminate hazardous waste characteristics.
- Sediment sampling and analysis from the former evaporation ponds to characterize leachable chromium.

Following completion of these activities, the prior owner certified closure of the inactive CDU to KDHE in February 1986. The KDHE stated on 12 September 1986 that the inactive CDU was closed in accordance with the 14 February 1985 closure plan and that the financial assurance requirements for closure and liability insurance for hazardous waste facilities were no longer required. Documentation available to KNC indicates that there was some dispute among the prior owner, KDHE, and USEPA about the effectiveness of this closure activity. The former owner subsequently submitted Part B of the RCRA permit application in 1990. KDHE issued the Part 1 RCRA Hazardous Waste Management permit (No. KSD044625010) to the prior owner, a petition for review was filed, KNC requested that KDHE transfer the Part I Permit to KNC, and the Part 1 permit was transferred to KNC, effective on 20 May 2003 .

In accordance with Section III.B.1 of the Part 1 Permit, KNC submitted a Closure Plan for the inactive CDU to KDHE and USEPA on 13 January 2004. In a letter dated 26 October 2004, and incorporated into Appendix A of the Draft RFI Work Plan submitted to the USEPA and KDHE, KNC provided an amendment to the 13 January 2004 Closure Plan to address newly identified information by KNC on the management of solid waste management units (SWMUs) 23 and 24. Specifically, the results of toxicity characteristic leaching procedure (TCLP) testing of sludge from SWMUs 23 and 24, concrete chip sampling of SWMU 24, and epoxy sampling of the coating

in SWMU-23 did not identify chromium above the regulatory limit for characteristically hazardous chromium (5 milligrams per liter [mg/L]).

KDHE and USEPA provided comments to the Draft RFI Work Plan and revised CDU Closure Plan (Appendix A of the Draft RFI Work Plan) in a letter dated 2 May 2005. In a 2 June 2005 response to these comments, KNC indicated to KDHE and USEPA that information on the investigation of the inactive CDU would be incorporated into the RFI work, which has been on-going since KDHE and USEPA approved the RFI Work Plan on 24 January 2006. Closure documentation from previous work performed in the inactive CDU is provided in Appendix I-1.

I-2 Closure Plan

The Closure Plan for structures associated with the former CDU that are still present and are no longer in use (asphalt detention basins and influent box) consists of characterization and subsequent management based on testing of samples collected along the sidewalls of the influent box and the floors of the influent box and detention basin. There are no wastes left within the above-ground units that would require dewatering or stabilizing. Closure activities associated with surface soil, subsurface soil, and groundwater will be determined after completion of the RFI and Corrective Measures Study. In the interim, groundwater recovery and treatment will continue as discussed in the post-closure plan.

TCLP analysis will be performed on concrete chip samples collected from the sidewall of the influent box and two samples from the base (east and west) floor of the influent box. A total of four samples will be collected from asphalt samples within the detention basin. The analytical results from TCLP analyses will be used to determine the regulatory disposal requirements for the concrete, asphalt, and debris removed from the facility during closure activities. The proposed asphalt and concrete chip sampling program will be in accordance with Table 6-2 at the locations described in Figure 4-14 of the RFI Work Plan (KNC, 2005) (Provided in Appendix I-2). Sampling and analysis will be performed in accordance with the Quality Assurance/Quality Control (QA/QC) program outlined in the 2005 Quality Assurance Project Plan (QAPP) submitted in 2005 and revised/updated in 2011.

If the concentrations of site constituents in these samples are characteristically hazardous, the influent box or the detention basin will be removed using a backhoe or other heavy equipment. The units will be broken into pieces that are suitable for off-site disposal, which will be performed in accordance with applicable hazardous waste regulations, specifically on-site management requirements and the land disposal restrictions, if applicable.

If sample results indicate that constituents are below characteristically hazardous levels using TCLP, no removal or decontamination of these structures will be performed. Suitable decontamination of each of the existing structures will be considered complete if the units exhibit no characteristics of hazardous waste.

Stormwater will be controlled during any remedial action at the inactive CDU. If excavation is

performed, temporary dikes will be used to prevent runoff from entering excavations. Hay bales, plastic covers, or other suitable control methods will be used to prevent erosion releases from the excavation and soil stockpile or loading areas relating to the closure of the inactive CDU. All expendable materials used for runoff or erosion control during the closure will be sampled prior to disposal to identify the applicable disposal method.

I-3 Closure Performance Standards

The closure requirements of 40 CFR 264.111 (KAR 28-31-264 and 264a) establish closure performance standards that must be met to close the inactive CDU, including:

- Minimizing the need for future maintenance;
- Controlling, minimizing or eliminating, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and
- Complying with the requirements for surface impoundments (40 CFR 264.228).

The following closure requirements of 40 CFR 264.228 (a)(1) and 40 CFR Part 264.228(c)(1) must also be achieved:

- Remove or decontaminate all waste residues, contaminated containment system components, contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless 40 CFR 261.3(d) applies; and
- In accordance with 40 CFR 264.228(a), where some waste residues are left in place at final closure, the closure plan must include appropriate procedures for closing with waste in place in accordance with the closure and post-closure requirements of 40 CFR 264.117 - 264.120.

In order to meet the closure standards established by the regulations, KNC will perform all decontamination and system component management under the closure plan provided in Section I-2. Management of soils and groundwater will be addressed under site-wide RFI activities.

I-4 Maximum Waste Inventory

The inventory requested in this section would require speculation about the characterization of wastewater produced by the Farmland Industries process thirty or more years ago. KNC has located very little in the historic record that provides the information needed to produce an accurate inventory at that time. According to the historic records that discuss the events described in Section I-1, closure activities of the CDU consisted of the following:

- Draining and flushing the cooling system to remove soluble chromium until hexavalent chromium was no longer detected in the flush water.

- Removing the remaining cooling water chemical from chemical storage and having it shipped off-site. Following removal of the inhibitor the storage tanks were triple rinsed to remove residual chromium.

- Treating flush and rinse water to eliminate hazardous waste characteristics.

- Sediment sampling and analysis from the former evaporation ponds to characterize leachable chromium.

I-5 Schedule

The schedule for decommissioning the inactive CDU components is summarized below:

- Sample Collection and Data Evaluation - 60 days

- Removal/Decontamination of Influent Box and Detentions Basins - 30 days

- Closure Documentation for Inactive CDU Components - 45 Days

As noted above, assessment and remediation of surface soils, subsurface soils, and groundwater is being performed as part of the site-wide RFI. Consequently, final closure of the CDU will be achieved at the completion of site-wide assessment and corrective action activities. A tentative schedule for site-wide RFI, corrective measures study, and corrective measures implementation is summarized below. Please note that this schedule is highly dependent on completion of delineation activities and USEPA and KDHE review.

- Completion of RFI Field Work - 2014

- Submittal and Approval of RFI Report - 2015

- Corrective Measures Studies - 2015 to 2016

- Implementation of Corrective Measures - 2016 to 2018

I-6 Post Closure Plan

KNC proposes to conduct additional investigation of remaining above-ground CDU components (influent and detention basins) to confirm the partial closure of this unit. This Post-Closure Plan has been designed to assure impacts to human health and the environment are minimized through groundwater containment and monitoring activities until a final remedy for surface and subsurface soil in the area of the inactive CDU and other areas is determined after completion of the RFI and corrective measures studies. Recovery and monitoring wells provide monitoring points to

evaluate constituents of concern in groundwater and to allow removal and treatment of groundwater from suspected source areas and downgradient locations. Recovered groundwater is transferred to a reverse osmosis (RO) unit where it is treated and beneficially re-used within the plant. RO concentrate is deep well injected under permit.

Closure of the CDU was performed by Farmland in the early 1980's and closure of the CDU was certified in February 1986. Following closure as a hazardous waste treatment unit, the CDU was adapted to treat recovered groundwater by chromium reduction. The CDU provided groundwater treatment until 1991 when a new chromium treatment facility was constructed. The upgraded treatment system included the electrochemical reduction of hexavalent chromium to trivalent chromium, which was then removed from the water by precipitation. The former electrochemical treatment system was located in the Chromium Treatment Building and adjacent settling tank. In 2006, KNC installed a new reverse-osmosis (RO) treatment unit, the Osmo PRO 300 System. The system consists of a feed pump and chemical pretreatment, the RO machine (membrane assembly), permeate collection, and drain of rejected water to the process sewer for subsequent deep well injection through Wastewater Disposal Well No. 2 or 3. The RO system and associated equipment are located in the southeast corner of the Phase I Building.

The recovery, treatment, and disposal systems will be operated, maintained, sampled, and inspected consistent with this Plan and other referenced Plans. The persons to contact during the post-closure care period are the Plant Manager or the Environmental Manager. Amendments to this Plan will be submitted in writing in accordance with 40 CFR 264.118.

I-6.1 Inventory Removal and Decontamination of Equipment

Removal of groundwater during sampling or recovery is performed in accordance with the Groundwater Sampling and Analysis Plan (GWSAP) in Section E, Appendix E-1.

I-6.2 Duration of Post-Closure Period

The post-closure care period has been assumed to continue for 30-years, in accordance with 40 CFR 264.117(a)(1). If there are outstanding corrective action issues that require an extension of Post-Closure care, the Post-Closure care period will be extended. The duration of the Post-Closure care may also be shortened in accordance with the terms of the Part B permit or if the appropriate agencies determine that a reduced Post-Closure period is sufficient to protect human health and the environment. Corrective action will be considered complete when the groundwater protection standard has not been met or exceeded at and beyond the point of compliance for a period of three consecutive years. Upon completion of Post-Closure care, KNC will petition the appropriate agency to terminate Post-Closure care and associated monitoring requirements.

No later than 60 days after completion of the established Post-Closure care period, certification of completion of Post-Closure care will be submitted to the appropriate agencies in accordance with 40 CFR 264.120.

I-6.3 Post-Closure Inspection Plan [40 CFR 270.14 (b)(5)]

KNC conducts regular inspections of the monitoring wells and Wastewater Disposal Wells No. 2 and 3 for integrity, operating problems, and discharges that could cause adverse effects to the environment or threaten human health. The following subsections summarize post-closure inspection components, frequency, and rationale.

Inactive CDU

The remaining inactive CDU above-ground components are no longer utilized to treat groundwater and exposed facilities were reportedly cleaned at the time of removal from service and closure of that unit. Access to the former CDU location is restricted to Plant personnel. No exposure risk has been identified with the former CDU. Based on current Plant information, no inspection needs at the former CDU have been identified. The Plant's Environmental Manager must be informed of any changes or disruptions to the former CDU area. Any work in this area would require the Environmental Department to sign off on a management of change (MOC) form.

Monitoring Wells

Well integrity is checked when sampling is performed. These inspections include a structural integrity evaluation of the casing, inspection for any leakage around the casing, evaluation of the presence of the lockable well cap, and the presence of overgrown vegetation. Total well depth is checked on an annual basis for wells without pumps. Wells equipped with pumps are checked anytime that a pump is pulled for any reason. Pumps are pulled at least once every five years. Water levels are determined, when sampled, during each sampling event. For monitoring wells, the most critical items are as follows:

- Well Integrity - If a well fails structurally, leakage into the well may cause contamination or dilution of the groundwater. Another problem could be soil entrance, causing the well to silt in.

- Water Level - While not specifically a problem, if the groundwater level drops, this may signal the need to install a new well in order to secure samples.

- Total Well Depth - Must be checked to assure that the well is not silting in due to fine-grained soil entering the well through the screen.

Wastewater Disposal Wells

Wastewater Disposal Wells No. 2 and 3 are operated under Class I Non-Hazardous Waste Injection Well Permits from KDHE. The disposal well permits require certain monitoring items to be read daily. These requirements could vary over time and currently include:

- Injection well vacuum
- Annulus seal pot (tank) level
- Annulus pressure
- Injection flow rate
- Injection daily total flow

Most of these items require physical monitoring at the well site every day, which is also a part of the permit requirements. Instrumentation exists to monitor additional items from the wastewater filter building, including:

- Injection tank level and
- Leak detection alarm for Wastewater Disposal Wells No. 2 and 3.

The most critical items are as follows:

- Loss of annulus seal pot level or annulus pressure: This indicates failure of the well casing or injection tubing. If this happens, the well must be shut down immediately and KDHE notified.
- Loss of injection well vacuum: KNC is not permitted to inject on pressure. The reason for the injection tank is to prevent any pressure. Should pressure build, the injection rate must be slowed.
- pH: Waste injection may occur at a pH of range 5 to 10 standard units (s.u.).

I-6.4 Inspection Reports

In order to properly track the condition of the monitoring wells, KNC will use the procedures and forms outlined in the GWSAP. The disposal well monitoring items are recorded on the Class I Injection Well Monitoring Report. These inspection reports are kept at the Plant.

I-6.5 Notice In Deed

A copy of the required deed notice is provided in Appendix I-3.

I-6.6 Groundwater Monitoring Plan

Procedures to be used for sampling and analysis of groundwater are described in detail in the GWSAP (Appendix E-1). Groundwater monitoring is performed at the frequency specified by the GWSAP.

Available records indicate that corrective action associated with the hydraulic containment and treatment of groundwater was initiated in 1982. Many of the groundwater monitoring requirements for corrective action have been in effect since 1982 and are found in the GWSAP (Appendix E-1). The compliance period noted in the Groundwater Monitoring Plan is the time needed until the groundwater in each compliance point well does not exceed the groundwater protection standard for a period of three consecutive years. KNC has established and implemented a groundwater monitoring program designed to demonstrate the effectiveness of the corrective action program.

I-6.7 Corrective Action Program

The corrective action measures implemented in the past included: i) discontinued use of chromate-based corrosion inhibitors in cooling towers; ii) pressure testing and elimination of buried piping; iii) partial closure of the CDU; and iv) groundwater recovery and treatment. The latter task (groundwater recovery and treatment) is actively utilized to remove and treat groundwater between the proposed compliance point and downgradient property boundary, plus some groundwater beyond the facility boundary. The static water levels in the suspected source area have been reduced by 10 feet or more since pumping started.

I-7 Corrective Action System Overview of Operating Procedures

Recovery well operation can be controlled manually or by radio telemetry using an industrial computer for operator interface. The current system allows the selection of individual banks of wells to be turned on or off with the telemetry equipment, as required for maintenance. Recovered groundwater is transferred via below-ground piping to the RO unit.

The RO system purifies the recovered groundwater by forcing it through a semi-permeable RO membrane, “rejecting” impurities by retaining them on the feed side of the membrane. The purified water (“permeate”) is used in the Plant’s industrial processes. This system is expected to maintain a rejection efficiency for hexavalent chromium of 99.0 to 99.4 percent. The RO system is capable of treating all of the recovered groundwater for reuse in the industrial processes in the Plant prior to its disposal in the two existing Class I non-hazardous waste injection wells. During normal operation, the electronic sensors and controls will maintain control of the RO system through PID control loops. Any alarm conditions will be displayed at the bottom of the screen. Operation personnel collect samples at every 12-hour shift and chromium levels in the effluent are maintained below 0.05 ppm. The RO system can be shut down at the machine or remotely using the operating computer system by clicking on the Emergency Stop button.

Treated water is either used within the plant or transferred via pipeline to the Wastewater Disposal Wells for injection. Prior to injection, wastewater is passed through a series of filters, which are monitored during each shift to ensure proper operation, and transferred to the injection tank. A pH meter monitors wastewater prior to discharge to insure the injection pH is within the range of 5 to 10 s.u. Sulfuric acid or caustic may be added, as required, to insure the pH of injected water is between 5 and 10 s.u. An antiscalent addition is also added to prevent formation of scale in the well. Antiscalent addition is generally determined from the wastewater flow rate to the well from the filter building. A signal from the flowmeter is sent to the metering pump to control the amount of antiscalent added to the injected wastewater.

I-8 Cost Estimate

Appendix I-4 provides the estimated costs for post-closure. These costs were developed based on previous and recent vendor quotes, invoices for similar work performed at the Plant, and previous KNC and contract labor and expense to perform the work components described. Appendix I-4 also contains closure costs for above-ground components of the CDU with an assumed on-site (non-hazardous) disposal of these components in the Facility landfill.

Total closure and post-closure cost for the CDU, with a 10% contingency, is estimated at $7,585,292.

I-9 Financial Assurance

A surety bond providing financial assurance for closure and post-closure activities is provided in Appendix I-5. The cost estimate for closure and post-closure will be adjusted annually for inflation and submitted to KDHE within 60 days of the anniversary date of the financial instrument, in accordance with 40 CFR 264.142(c) and 264.144(c), and KAR 28-31-264. Whenever a change in the closure, post-closure, or corrective action plan is required that will also require adjustment of the closure or post-closure cost estimate, a revised cost estimate will be submitted to KDHE no later than 30 days after agency approval of the change in the closure, post-closure, or corrective action plan, and a revised financial instrument (if required) will be submitted within 60 days of the approval of the revised cost estimate, in accordance with 40 CFR 264.143(b)(7) and 264.145(b)(7), and KAR 28-31-264. A copy of the financial instrument will be maintained at the Facility.

I-10 Liability Requirements

Liability insurance is provided in Appendix I-6.

SECTION J

SOLID WASTE MANAGEMENT UNITS
40 CFR 270.14 (d)

J-1 General Description - 40 CFR 270.14(d)(1)

In July 2000, EPA issued a draft RCRA Facility Assessment (RFA) report that identified twenty-two potential SWMUs and six potential areas of concern (AOCs). Four wastewater treatment basins were added to the list of Solid Waste Management Units in 2002. The location of the SWMUs is shown in Figure J-1. The RFI Workplan submitted in October 2004, the Phase II RFI Workplan submitted by KNC in September 2008, and the Phase II: Tier II Soil Sampling Work Plan submitted by KNC in July 2012 present a comprehensive description of each SWMU and AOC; the findings of historical investigations conducted in these areas; and the proposed program for future investigation in those areas deemed to require additional investigation. The following is a comprehensive listing of all of the identified SWMUs and AOCs at the Plant. The attached figure illustrates the locations for all of the identified SWMUs and AOCs.

Solid Waste Management Units (SWMUs)

SWMU #1	South Pond
SWMU #2	North Pond
SWMU #3	East Pond
SWMU #4	Former Disposal Well #1
SWMU #5	Landfarm
SWMU #6	Former Washout Area
SWMU #7	Landfill for General Plant Trash
SWMU #8	Former Chrome Destruct Unit
SWMU #9	Current Chrome Destruct Unit
SWMU #10	East Cell of the Lime Sludge Pond
SWMU #11	West Cell of the Lime Sludge Pond
SWMU #12	Disposal Area (North of the South Pond)
SWMU #13	Disposal Well #2
SWMU #14	Settling Basin by Chromium Treatment Building
SWMU #15	Equalization Tank
SWMU #16	Wastewater Tank
SWMU #17	East Lime Sludge Landfill
SWMU #18	Construction Landfill
SWMU #19	West Lime Sludge Industrial Landfill
SWMU #20	Disposal Well #3
SWMU #21	UIC Well #2 Cuttings
SWMU #22	UIC Well #3 Cuttings

SWMU #23	Neutralization Basin #1
SWMU #24	Neutralization Basin #2
SWMU #25	Neutralization Basin #3
SWMU #26	West Side Basin

Area of Concerns (AOCs)

AOC #1	Chromate Spills
AOC #2	Process Sewer Line to Former Ponds
AOC #3	Sanitary Sewage Pump Station
AOC #4	Former Gas Shed on the Old Farm
AOC #5	UAN Storage Tank Leak
AOC #6	Dakota Formation

J-2 Release of Hazardous Wastes - 40 CFR 270.14 (d)(2)

Historical records indicate the most significant release of constituents of concern resulted from the release of approximately 1,200 gallons of corrosion inhibitor containing chromic acid to the soil. This historic release is believed to be the principal source of chromium in the groundwater at the Plant, rather than releases from identified solid waste management units.

Soil investigations completed near former chromic acid chemical handling locations identified the presence of elevated chromium in the soil. Farmland initiated interim remedial action at the property to contain, recover, and treat groundwater at the Plant, and KNC is continuing these remedial actions by operating the existing groundwater recovery system.

J-3 Sampling and Analysis - 40 CFR 270.14 (d)(3)

The sampling and analysis plan for groundwater monitoring is discussed in Section E of this application. Reports of analysis of well samples have been submitted to the KDHE since 1982. A system of monitoring wells has been developed under the oversight of KDHE.

SECTION K

OTHER FEDERAL LAWS
40 CFR 270.14 (b)(20)

K-1 Wild and Scenic Rivers Act

There are no wild or scenic rivers in the project area.

K-2 National Historic Preservation Act of 1966

Compliance with the National Historic Preservation Act of 1966 is not required because the Dodge City Nitrogen Plant is not planning construction projects as part of this permit renewal application.

K-3 Endangered Species Act

The Dodge City Nitrogen Plant is an existing facility and no wildlife habitat will be impacted by operation of the facility. No construction of new facilities or modification to existing facilities is proposed.

K-4 Coastal Zone Management Act

The Dodge City Nitrogen Plant is not located in the coastal zone; therefore, compliance with this act is not required.

K-5 Fish and Wildlife Coordination Act

Compliance with the Fish and Wildlife Coordination Act is not required because the Dodge City Nitrogen Plant is not planning the impoundment, diversion, or other control or modification of any body of water.

SECTION L

PART B CERTIFICATION
40 CFR 270.11

Part B Permit Application
Koch Nitrogen Company, LLC
Dodge City Nitrogen Plant
11559 U.S. Highway 50
Dodge City, Kansas

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

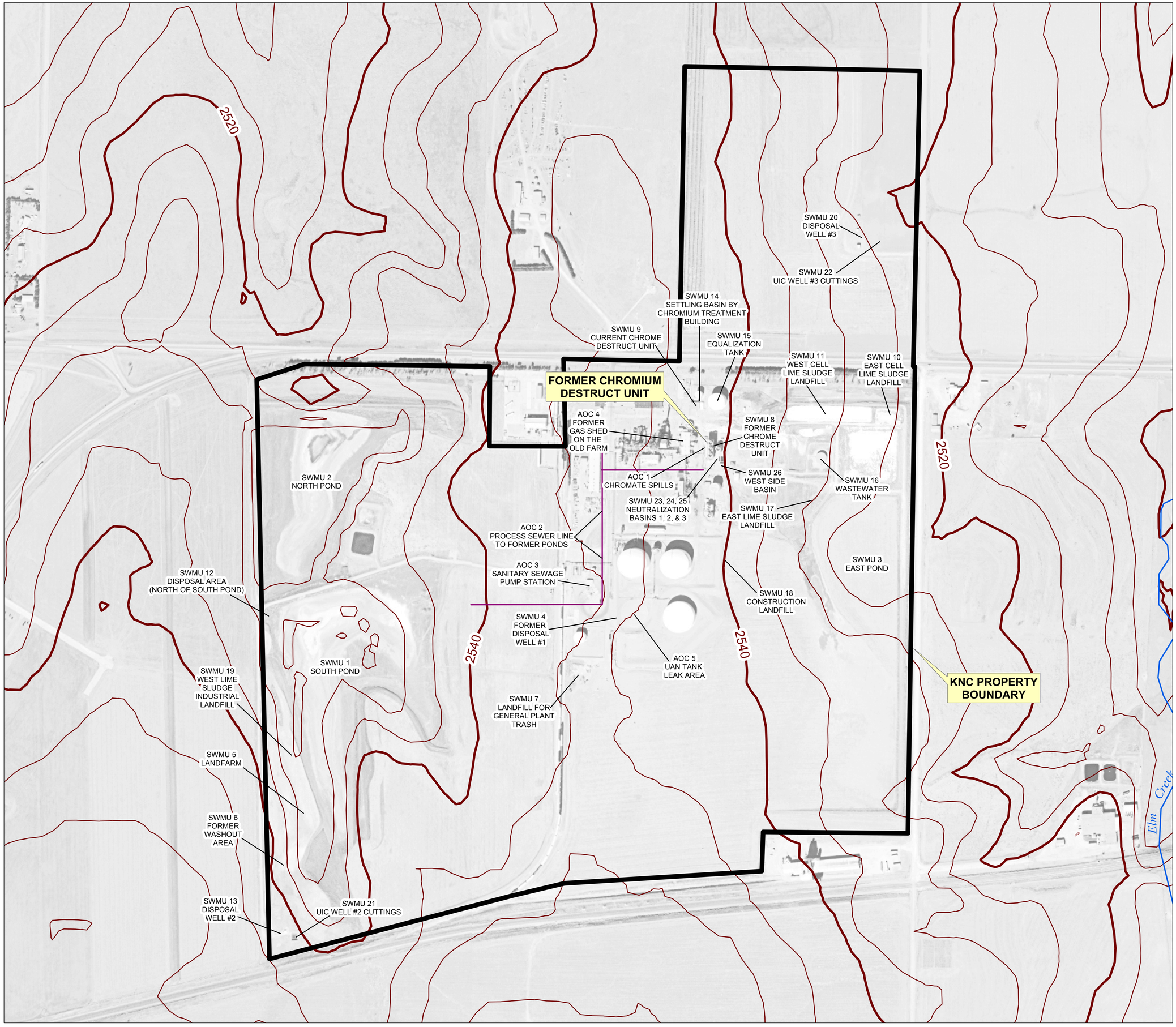
KOCH NITROGEN COMPANY, LLC

_____ _____

Michael J. Sherbak II Date
Plant Manager

ATTACHMENT C

FIGURE REPLACEMENTS



LEGEND

- STREAM
- INDEX TOPOGRAPHIC CONTOUR - 20 FT. INTERVAL
- INTERMEDIATE TOPOGRAPHIC CONTOUR - 5 FT. INTERVAL

SWMU LIST

1. SOUTH POND
2. NORTH POND
3. EAST POND
4. FORMER DISPOSAL WELL #1
5. LAND FARM
6. FORMER WASHOUT AREA
7. LANDFILL FOR GENERAL PLANT TRASH
8. FORMER CHROME DESTRUCT UNIT
9. CURRENT CHROME DESTRUCT UNIT
10. EAST CELL OF LIME SLUDGE POND
11. WEST CELL OF LIME SLUDGE POND
12. DISPOSAL AREA (NORTH OF SOUTH POND)
13. DISPOSAL WELL #2
14. SETTLING BASIN BY CHROMIUM TREATMENT BUILDING
15. EQUALIZATION TANK
16. WASTEWATER TANK
17. EAST LIME SLUDGE LANDFILL
18. CONSTRUCTION LANDFILL
19. WEST LIME SLUDGE INDUSTRIAL LANDFILL
20. INJECTION WELL #3
21. UIC WELL #2 CUTTINGS
22. UIC WELL #3 CUTTINGS
23. NEUTRALIZATION BASIN #1
24. NEUTRALIZATION BASIN #2
25. NEUTRALIZATION BASIN #3
26. WEST SIDE BASIN

AOC LIST

1. CHROMATE SPILLS
2. PROCESS SEWER LINE TO FORMER PONDS
3. SANITARY SEWAGE PUMP STATION
4. FORMER GAS SHED ON THE OLD FARM
5. UAN STORAGE TANK LEAK
6. DAKOTA FORMATION (NOT SHOWN)

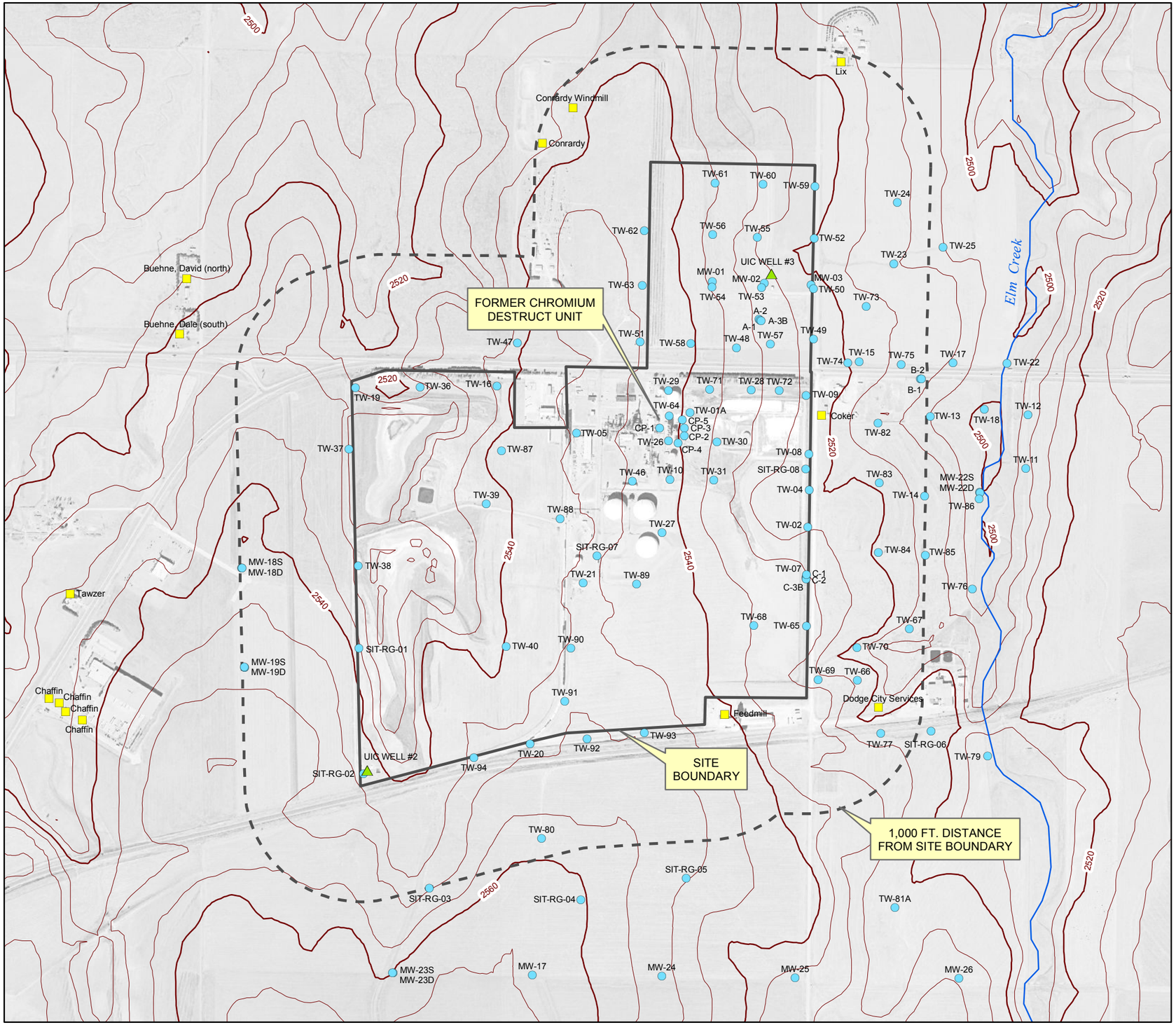
-N-

500 0 500
Feet
1 inch = 200 feet

TOPOGRAPHIC MAP

PREPARED BY:
KOCH
KOCH NITROGEN COMPANY, LLC

PROJECT NO.	FIGURE NO. A-1
DATE. MAY 2013	REVISION NO.



LEGEND

- KNC MONITORING OR RECOVERY WELL
- KNC INJECTION WELL
- PRIVATE WATER USE WELL
- STREAM
- INDEX TOPOGRAPHIC CONTOUR - 20 FT. INTERVAL
- INTERMEDIATE TOPOGRAPHIC CONTOUR - 5 FT. INTERVAL

-N-

1,000 0 1,000

Feet

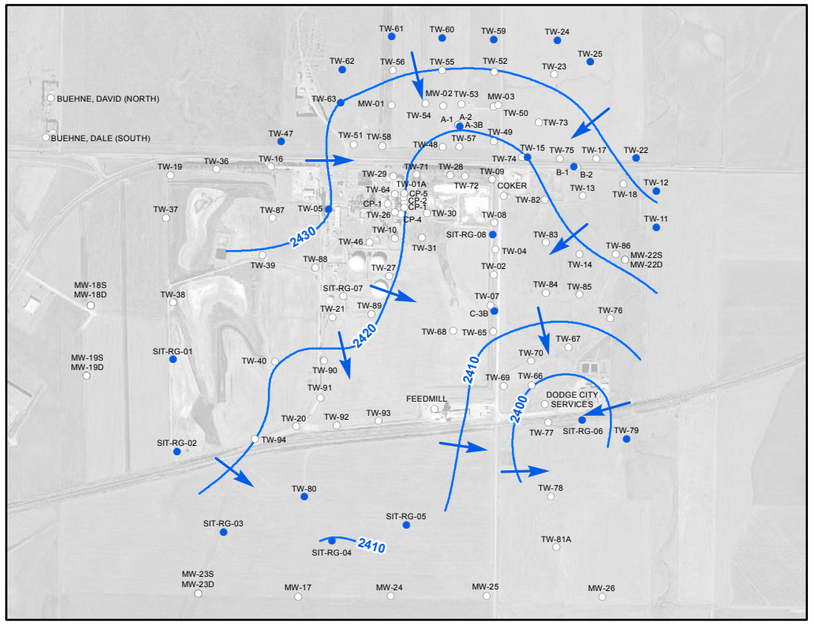
INJECTION AND WITHDRAWAL WELLS

PREPARED BY:

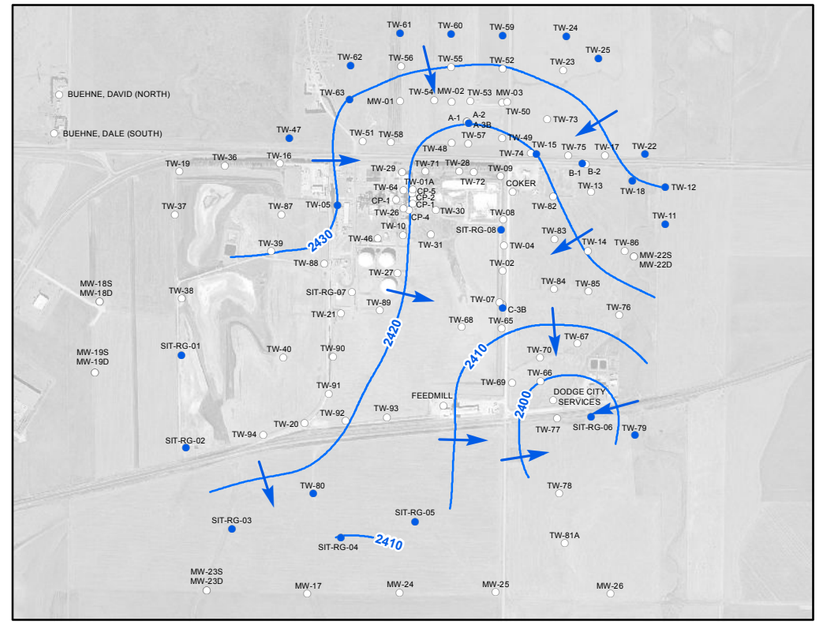
KOCH

KOCH NITROGEN COMPANY, LLC

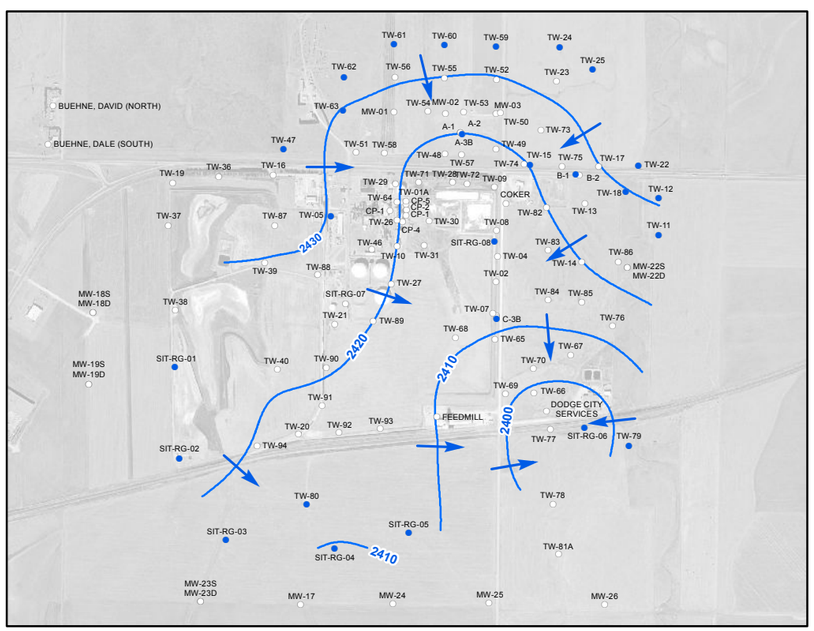
PROJECT NO.	FIGURE NO. B-7
DATE. MAY 2013	REVISION NO.



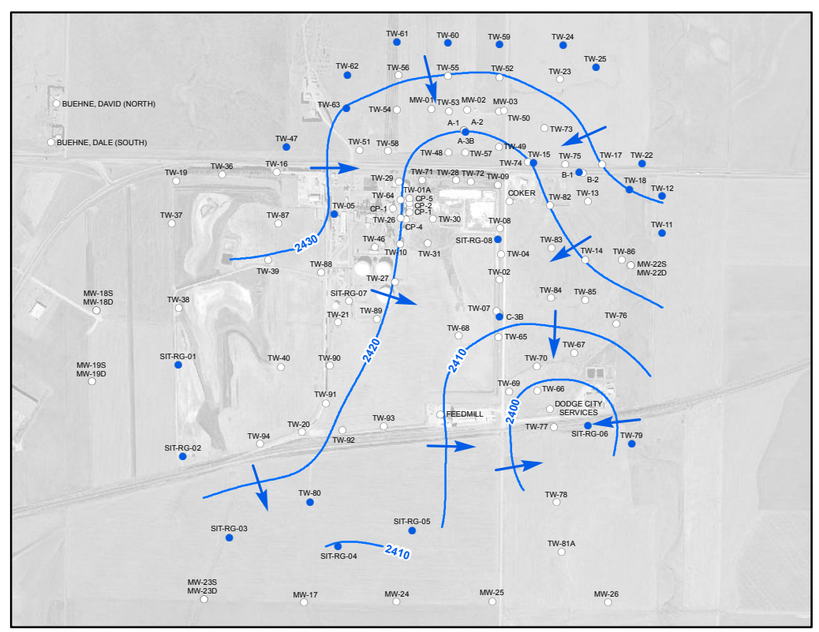
Potentiometric Surface Contours - First Quarter 2011



Potentiometric Surface Contours - Second Quarter 2011



Potentiometric Surface Contours - Third Quarter 2011



Potentiometric Surface Contours - Fourth Quarter 2011

LEGEND

- MONITORING WELL SELECTED FOR POTENTIOMETRIC SURFACE CONTOURING IN RESPECTIVE 2011 QUARTER
- MONITORING WELL NOT USED FOR CONTOURING PURPOSES
- POTENTIOMETRIC SURFACE CONTOUR (FT AMSL) FOR RESPECTIVE 2011 QUARTERLY GAUGING EVENT - 10 FT CONTOUR INTERVAL
- GROUNDWATER FLOW DIRECTION

-N-

0 0.5 1
Miles

GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR MAPS

PREPARED BY:

KOCH
KOCH NITROGEN COMPANY, LLC

PROJECT NO.	FIGURE NO. E-2
DATE. MAY 2013	FILE NO.